

REMARKS

The Office Action mailed July 2, 2003 has been received and the Examiner's comments carefully reviewed. Claims 1, 11, 16, 19 and 24-25 have been amended. Claims 26 and 27 have been added. No new subject matter has been added. Claims 1-5 and 7-27 are currently pending. Applicants respectfully submit that the pending claims are in condition for allowance.

It is noted that claim 1, 11, 16, and 19 have been amended to change the recitation of "capable of letting" to "that lets" pursuant to a telephone conversation with the Examiner on June 18, 2003. Claims 24 and 25 have been amended to correct some grammatical errors.

Rejections Under 35 U.S.C. §103

The Examiner rejected claims 1-5 and 7-25 under 35 U.S.C. §103(a) as being unpatentable over Jerman et al. (U.S. Patent 6,134,207) in view of Roth (PCT Pub. No. WO 02/21191). Applicants respectfully traverse these rejections.

I. Claims 1-5 and 7-10

Claim 1 recites an optical switch including a first actuator having a first mirror and a second actuator having a second mirror. The first mirror includes a notch that lets an optical beam pass through the first mirror.

Jerman discloses a data storage system having a number of mirrors 103. Each mirror 103 may be positioned in either a retracted position or an extended position. In the retracted position, light is permitted to pass to another mirror to reflect the beam to an output specifically associated with that other mirror. Jerman teaches that each of the mirrors is either extended to reflect the beam to a specific output, or retracted to allow the beam to pass to another mirror. Jerman does not disclose a mirror including a notch as recited in claim 1.

There is no motivation to form a notch, or bore as taught by Roth, in the mirror of Jerman. If a mirror 103 of Jerman was modified to include "a notch that lets an optical beam pass through the mirror without being reflected," the device would be rendered

inoperable. That is, a notched mirror 103 in the system taught by Jerman would never reflect a beam because the mirror is positionable only in either one extended position or a retracted position. In fact, both Jerman and Roth teach positioning the mirrors in only one extended position and a retracted position. Thus, if a first mirror 103 of Jerman were modified to include a notch, the beam would pass through the notch of the first mirror when in the extended position, and the beam would pass through to another mirror when the first mirror was in the retracted position. Thus, combining the teachings of Roth with Jerman would render the modified Jerman device inoperable.

At least for this reason, Applicants respectfully submit that independent claim 1 and dependent claim 2-5 and 7-10 are patentable.

II. Claims 11-15

Claim 11 recites a method of switching an optical switch, the optical switch including a first mirror having a notch that lets an optical beam pass through the first mirror without being reflected. For similar reasons as discussed with regards to claim 1, Applicants respectfully submit that claim 11 is patentable.

In addition, claim 11 recites controlling first and second actuators to position first and second mirrors to reflect and/or pass the optical beam therethrough to form at least four optical outputs. Neither Jerman nor Roth teach or suggest a 1X4 switch configuration provided by positioning first and second mirrors.

In particular, Jerman teaches that each mirror 103 of the data storage system is associated with a particular output port 151. Column 16, lines 30-34. In use, only one mirror is extended to direct the input to a desired output port 151, and the remaining mirrors are retracted. In other words, one mirror directs an input to a specific output, thus two mirrors can only direct the input to one of two specific outputs. Jerman does not teach or suggest a method including positioning first and second mirrors to form at least four optical outputs.

Likewise Roth teaches a beam translator having only a 1X2 or a 2X2 switch configuration. For example, the embodiment of FIG. 5a teaches an arrangement having two inputs 202, 204 that are directed to two outputs 206, 208. Roth does not teach or

suggest a method including positioning first and second mirrors to direct an optical beam to form at least four optical outputs.

For at least these reasons, Applicants respectfully submit that independent claim 11 and dependent claims 12-15 are patentable.

III. Claims 16-20

Independent claims 16 and 19 each recite an optical switch including a switching component. The switching component includes a first mirror having a notch. As discussed previously with regards to claim 1, Applicants respectfully submit that neither Jerman nor Roth provide the motivation to form a notch, or bore as taught by Roth, in the mirror of Jerman.

Further, claim 19 has been amended to further clarify that each of the mirrors of the pair of mirrors is selectively positionable relative to one another to provide the at least four outputs. As previously discussed with regards to claim 11, Applicants respectfully submit that neither Jerman nor Roth teach or suggest a pair of selectively positionable mirrors that provide at least four optical outputs.

Applicants therefore respectfully submit that independent claims 16 and 19, and dependent claim 17-18 and 20 are patentable.

IV. Claims 21-23

Claim 21 recites an optical switch having first and second actuators. The first actuator is a double comb driver actuator capable of moving the first mirror into a first extended position, a second extended position, and a retracted position.

Neither Jerman nor Roth teaches a double comb driver actuator. Both references teach only an actuator capable of moving a mirror into a single extended position and a retracted position. The Examiner asserts that it would have been obvious to one skilled in the art to provide both a notch and a double comb driver actuator to move the mirrors to a second extended position to permit a beam to pass through the notch.

It appears the Examiner has used Applicants' disclosure as a starting point for the basis of this rejection, and worked backward to reconstruct the claimed invention and provide motivation to modify the cited references. This is clearly improper. Nowhere

does Jerman suggest a double comb actuator, or provide motivation to modify the device to include a double comb actuator for positioning a mirror in one of two extended positions. Rather, Jerman teaches only that the actuator should translate a sufficient distance to capture the entire diameter of a laser beam. Roth also does not suggest a double comb actuator, or provide motivation to modify the device to include a double comb actuator for positioning a mirror in one of two extended positions.

At least because neither reference teaches or suggests a double comb actuator, Applicants respectfully submit that independent claim 21 and dependent claims 22-23 are patentable.

V. Claims 24 and 25

Independent claims 24 and 25 each relate to an optical switch including first and second mirrors. The first and second mirrors are each positionable in a first extended position, a second extended position and a retracted position. In each of claims 24 and 25, the various combined positionings of the first and second mirrors takes an optical beam input and provides one of four outputs. Neither Jerman nor Roth teaches or suggests an arrangement wherein positioning first and second mirrors in the recited extended/retracted positions results in one of the four outputs. Rather, both Jerman and Roth disclose arrangements wherein movable first and second mirrors provide at most two outputs. At least for this reason, Applicants respectfully submit that claim 24 and 25 are patentable.

New Claims 26 and 27

New claims 26 and 27 depend respectively upon independent claims 1 and 16. In light of the above comments regarding independent claims 1 and 16, Applicants respectfully submit that claims 26 and 27 are patentable.

SUMMARY

It is respectfully submitted that each of the presently pending claims (claims 1-5 and 7-27) is in condition for allowance and notification to that effect is requested. The

Examiner is invited to contact Applicants' representative at the below-listed telephone number if it is believed that prosecution of this application may be assisted thereby.

Although certain arguments regarding patentability are set forth herein, there may be other arguments and reasons why the claimed invention is patentably distinct.


Applicants reserve the right to raise these arguments in the future.



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Respectfully submitted,

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